WHAT IS CLAIMED IS:

1. A Mode-locked laser, comprising:

a gain medium;

first and second reflectors disposed on opposite ends of said gain medium to form an optical cavity;

a third reflector disposed within said cavity and spaced from said first reflector to form a Fabry-Perot etalon which is near resonance at the laser frequency; and

a saturable absorber having nonlinear absorption characteristics and inducing mode-locked laser pulses, said absorber located within said Fabry-Perot etalon.

2. The laser of Claim 1, further comprising a Q-switching suppressor.

3. The laser of Claim 2, wherein said Q-switching suppressor comprises a two photon absorber (TPA) disposed within said cavity.

4. The laser of Claim 3, wherein said TPA is distributed within said cavity.

5. The laser of Claim 3, wherein said TPA is self-defocusing.

6. The laser of Claim 3, wherein said TPA is disposed on said saturable absorber.

7. The laser of Claim 3, wherein said TPA adjoins said first reflector.

8. The laser of Claim 3, wherein said TPA comprises a material selected from the group of InP, InGaAs, GaAs, InGaAsP, ZnS, CdSe, CdS, CdTe, AlAs and AlGaAs.

9. The laser of Claim 1, further comprising a protector which guards said saturable absorber from optically induced damage.

10. The laser of Claim 9, wherein said protector comprises a two photon absorber (TPA) disposed within said cavity.

11. The laser of Claim 10, wherein said TPA comprises a material selected from the group of InP, InGaAs, GaAs, InGaAsP, ZnS, CdSe, CdS, CdTe, AlAs and AlGaAs.

12. The laser of Claim 1, additionally comprising a polarization drift compensator disposed within said cavity.

13. The laser of Claim 1, wherein said saturable absorber is disposed between said first reflector and said third reflector.

14. The laser of Claim 1, wherein said saturable absorber is distributed within said cavity.

15. The laser of Claim 1, wherein said Fabry-Perot etalon is tunable.

16. The laser of Claim 1, wherein said Fabry-Perot etalon comprises a monolithic structure.

17. The laser of Claim 16, wherein said monolithic structure comprises a distributed bragg reflector overlying a semiconductor substrate.

18. The laser of Claim 17, wherein said monolithic structure further comprises:

a TPA adjoining said distributed bragg reflector; and

said saturable absorber adjoining said TPA.

19. The laser of Claim 1, wherein said Fabry-Perot etalon has a free spectral range which is large compared with the bandwidth of said mode-locked laser pulses.

20. The laser of Claim 1, wherein the bandwidth of resonance of said Fabry-Perot etalon is broader than the gain bandwidth of said laser.

21. The laser of Claim 1, wherein said saturable absorber comprises InGaAsP.

22. A method of generating cw mode-locked laser pulses, comprising:

generating Q-switched mode-locked laser pulses; and

suppressing Q-switching.

23. A method as defined in Claim 22, wherein said suppressing step comprises absorbing Q-switched laser pulses.

24. A method as defined in Claim 23, wherein said absorbing step absorbs a fraction of the Q-switched pulses.

25. A method as defined in Claim 23, wherein said absorbing step comprises two photon absorption.

26. A method as defined in Claim 22, wherein said generating step comprises:

pumping a gain medium located within a laser cavity; and

absorbing optical radiation from said gain medium in a Fabry-Perot structure.

27. A method as defined in Claim 26, wherein said generating step additionally comprises resonating said light within said Fabry-Perot structure.

28. A method of generating cw mode-locked laser energy, comprising:

evolving cw modelocking from Q-switched modelocking.

29. A cw mode-locked laser, comprising:

an optical cavity;

a gain medium within said optical cavity; and

a two photon absorber disposed within said cavity.

30. A mode-locked laser, as defined in Claim 29, wherein said two photon absorber induces cw mode-locked laser pulses.

31. A mode-locked laser as defined in Claim 29, wherein said two photon absorber comprises InP.

32. A cw mode-locked laser, comprising:

an optical cavity;

a gain medium within said optical cavity;

a saturable absorber disposed within said cavity, said saturable absorber having nonlinear absorption characteristics and inducing mode-locked laser pulses; and

a Q-switching suppressor disposed within said cavity.

33. A method of generating cw mode-locked laser pulses, comprising:

generating Q-switched mode-locked laser pulses; and

preferentially suppressing Q-switching without suppressing cw mode-locked laser pulses.

~~34. A method of generating cw mode-locked laser energy, comprising:~~

~~generating Q-switched mode-locked pulses; and~~

35. A mode-locked laser, comprising:

a gain medium;

first and second reflectors disposed on opposite ends of said gain medium to form an optical cavity; and

a resonant Fabry-Perot saturable absorber (R-FPSA) disposed within said cavity, said R-FPSA having nonlinear absorption characteristics and inducing mode-locked laser pulses.

36. The laser of Claim 35, further comprising a Q-switching suppressor.

37. The laser of Claim 36, wherein said Q-switching suppressor comprises a two photon absorber (TPA) disposed within said cavity.

38. The laser of Claim 37, wherein said TPA is distributed within said cavity.

39. The laser of Claim 37, wherein said TPA is self-defocusing.

40. The laser of Claim 37, wherein said TPA is disposed on said R-FPSA.

41. The laser of Claim 37, wherein said TPA adjoins said first reflector.

42. The laser of Claim 37, wherein said TPA comprises InP.

43. The laser of Claim 35, further comprising a protector which guards said R-FPSA from optically induced damage.

44. The laser of Claim 43, wherein said protector comprises a two photon absorber (TPA) disposed within said cavity.

45. The laser of Claim 44, wherein said TPA comprises InP.

46. The laser of Claim 35, additionally comprising a polarization drift compensator disposed within said cavity.

47. The laser of Claim 35, wherein said R-FPSA comprises a saturable absorber disposed between said first reflector and a partial reflector.

48. The laser of Claim 35, wherein said R-FPSA comprises a saturable absorber which is distributed within said cavity.

49. The laser of Claim 35, wherein said R-FPSA is tunable.

50. The laser of Claim 35, wherein ~~said~~ R-FPSA comprises a monolithic structure.

51. The laser of Claim 50, wherein said monolithic structure comprises a distributed bragg reflector overlying a semiconductor substrate.

52. The laser of Claim 51, wherein said monolithic structure further comprises:

a TPA adjoining said distributed bragg reflector; and

a saturable absorber adjoining said TPA.

53. The laser of Claim 35, wherein said R-FPSA has a free spectral range which is large compared with the bandwidth of said mode-locked laser pulses.

54. The laser of Claim 35, wherein the bandwidth of resonance of said R-FPSA is broader than the gain bandwidth of said laser.

55. The laser of Claim 35, wherein said R-FPSA comprises InGaAsP.

56. A mode-locked laser, comprising:

an optical cavity including a gain medium;

a Fabry-Perot etalon within said cavity which is near resonance at the laser frequency; and

a saturable absorber having nonlinear absorption characteristics and inducing mode-locked laser pulses, said absorber located within said Fabry-Perot etalon.

Add C2